This note introduces several accompanying documents and files related to the paper "Flux-induced topological superconductivity in full-shell nanowires," published in Science on 27 March 2020, and highlights a few key technical points in those documents.

Following a complaint by Science editor Jake Yeston on behalf of Sergey Frolov and Vincent Mourik (F&M), an investigation was initiated by the Practice Committee of the University of Copenhagen (PC). The complaint stated:

"The editors at Science believe that an independent, transparent investigation by experts in this subfield of Majorana physics is necessary to ascertain whether or not the authors unethically with-held data that undermined the conclusions of their paper." (Jake Yeston, Science editor, Exhibit 1).

After the authors responded to the complaint (Exhibit 4), Science editors reiterated their request for an investigation:

"*We have closely examined the reply and also discussed it with Professors Sergey Frolov and Vincent Mourik, who brought the original concerns to our attention. This discussion has reinforced our original belief that only a transparent, independent panel of scientists with deep expertise in the specific subject matter of Majorana physics can constructively assess the competing claims in the complaint and the reply. Professors Frolov and Mourik concur and will cooperate as needed with such an expert panel.*" (Jake Yeston, Science editor, Exhibit 5).

In response, the PC asked an Expert Panel (EP), comprising Sophie Guéron, Pertti Hakonen, Allan MacDonald, and Alfredo Levi-Yeyati (who later withdrew), to consider two points:

- *whether the data presented in the Science Magazine article accurately represented the outcome of the experiments undertaken, and*
- *whether the authors deliberately or due to gross negligence withheld data that undermined the conclusions of their paper.*

The EP report, submitted on 12 July 2023 (Exhibit 8), was published on Zenodo on 15 February 2024 (zenodo.org/records/10647080). The EP report gave three findings and several recommendations for the authors, editors, and community.

The findings were:

- *The presented data do, for the most part, represent the outcome of the experiments: the authors have exercised scientific judgment in selecting which data to share using criteria whose application was partially subjective. Although data selection did result in conclusions that did not adequately capture the variability of outcomes, the excluded data did not undermine the paper's main conclusions.*
- *The shortcomings noted in the manuscript do not constitute gross negligence.*
- *We do not view the authors' behavior in connection with this paper as an instance of scientific misconduct.*

The recommendations for the authors were:

1. *A statement explaining the set of criteria used to select acceptable nanowire devices, and a statistical summary of the success rate for growth and fabrication of devices deemed acceptable by these criteria, should be appended to the Vaitiekėnas et al. paper as a note added. The number of NIS devices that did not have successful tunneling spectroscopy should be stated, along with the number of devices with successful tunneling spectroscopy exhibiting ZBPs in the LP1 lobe and the number not exhibiting the ZBPs.*
2. *The full set (25+56) of Coulomb blockade data files should be uploaded to Zenodo, along with the descriptive table explaining why some datasets were excluded and the 2023 analysis.*

These recommendations are addressed in the following documents and files:

- **Procedures and Outcomes.pdf** – addressing recommendation 1.
- Folder **Coulomb Blockade Data** – addressing recommendation 2.

After receiving the EP report, the PC issued a letter and 12 exhibits on 21 December 2023. The letter is being uploaded as **PC Letter 21 Dec 2023.pdf** and the 12 accompanying exhibits are in the folder **Exhibits**.

The 21 December 2023 letter from the PC states:

"The only aspect of the case that might be considered as an instance of clear QRP [questionable research practice] *might be the delay by Prof Marcus and his co-authors in submitting the additional data requested by F&M as fast and as complete as F&M, with support from Science, requested."*

"The PC finds no evidence, neither in the Expert Report, nor in other evidence brought before it, that the purported delay by Prof Marcus and his coauthors violated stated academic norms within the scientific community in question.

In relation to the question of possible research misconduct, [...] the PC also finds no basis to reach a result different from that of the Expert Panel."

The case was subsequently transferred to the Danish National Research Board, which is qualified to consider matters of scientific misconduct.

We conclude by highlighting a few technical points from the Procedures and Outcomes document.

1. Discovery versus statistics. Procedures for wire growth, fabrication, and measurements were developed over the course of the experiment. Statistics requiring protocols with fixed procedures were not investigated. The paper reports a discovery of a phenomenon observed in a specific wire batch. The EP report notes:

"*The panel agrees with the authors that these failed and inconclusive experiments, which were not discussed explicitly, do not weaken conclusions based on the behavior of the samples with sound tunneling characteristics.*" (Exhibit 8, page 20).

2. Mixing data sets from accepted devices with pre-rejected devices. The EP panel asked the authors to analyze data that was previously unanalyzed or rejected before analysis and to plot those data along with data from devices that had been accepted during screening. This was an informal analysis mixing accepted and rejected data sets, and should be viewed in that context. The EP report notes:

"In the panel's view, the conclusion that the even-odd splitting declines rapidly with wire length stands with the additional data included." (Exhibit 8, page 19).

3. Measuring density of states in the wire requires tunneling without dots. Finding the correct tunneling regime in moderately disordered junctions requires an intermediate condition: if the junction is too open, conductance is not proportional to the local density of states, as discussed by Blonder, Tinkham, and Klapwijk (BTK). If the junction is too closed, reduced screening typically results in dots with resonances. How wire states interact with junction dots was investigated previously, theoretically and experimentally. The EP report notes:

"*In the judgment of the committee the authors' criteria for a proper tunneling regime make physical sense. If the tunnel barrier is demonstrably complex, the additional NIS data over extended gate voltage ranges does not provide evidence against the author's conclusions even when it does not have a clear Majorana signature.*" (Exhibit 8, page 14).

4. The importance of the lever arm. The lever arm characterizes how a voltage on a gate affects Coulomb-island energy. It is needed to convert even-odd peak spacing differences measured as gate voltages to an energy scale, allowing different-length devices to be plotted together. Section 6 of **Procedures and Outcomes.pdf** describes how the lever arm was measured in the same gate configuration and magnetic field values where the peaks were measured, and why that was important. The effect of lead coupling on the lever arm was previously investigated theoretically and experimentally, as discussed in Section 6.